



**Real Time Information — Currency of the New Decade**

Hilton San Francisco Union Square | San Francisco, CA

**April 26-28, 2010**

# Industrial Scale Demand Response

Brian Helms

Power Markets Coordinator

Alcoa Power Generation

# Warrick Power Plant

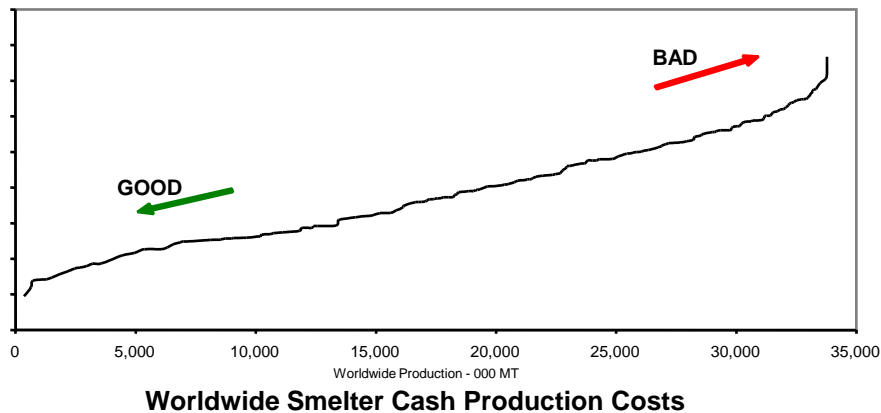


## Generation Assets:

- 780 MW's Coal Generation
- (4) B&W Wall-Fired Boilers
- Vintage 1960's
- 2.8 mm tons coal/annual
- Illinois basin with Low NO<sub>x</sub> burners/SCR
- FGD Scrubbers

# Aluminum Smelting Economics

**Energy is 30-40% of Aluminum Production Costs....**



**Competition in a  
Worldwide Commodities  
Market....**

**Warrick Operations is  
Alcoa's Largest Operating U.S. Smelter**

- **330,000 MT capacity/year**



# Midwest ISO Interface

## Warrick Power Plant



Energy  
Supplied



## Aluminum Smelter



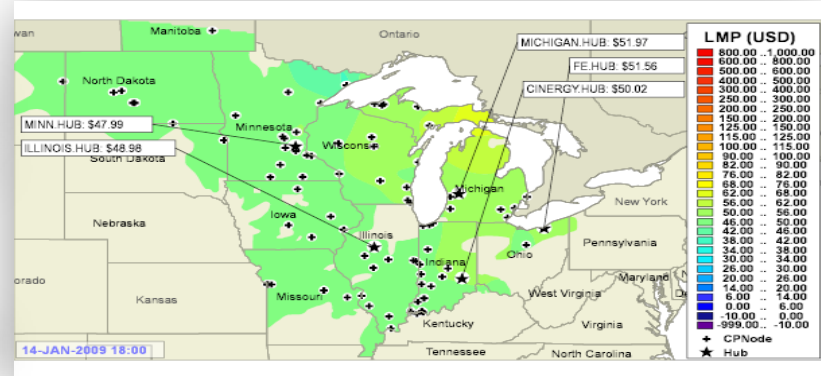
## Rigid Packaging

Energy  
Sales

Energy  
Purchases

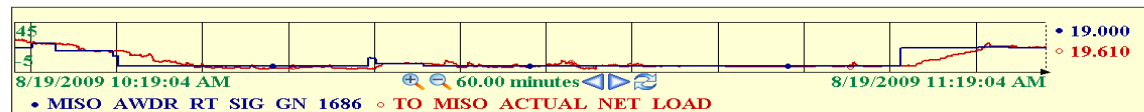
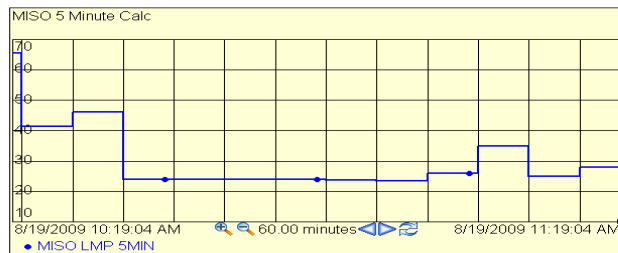
Demand  
Response

## Midwest ISO Market








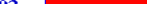
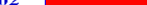


	Real Energy	Regulation	Spin Reserve
Cleared	<b>19</b>	<b>18</b>	<b>00</b>
Deployed	<b>19</b>	<b>00</b>	<b>00</b>



### Actual Meter

## Pot Line Trends

### Dispatch Status

Code	Percentage	Value
OCB 1500		91.3
OCB 1502		90.8
OCB 1503		92.8
OCB 1504		90.4
GCS 3805		00.0
GCS 3806		90.0
GCS 3800		00.0

**Last Hour LMP Price      31.75 dollars**

# Customer Driven

# Hyperlinks

# High Level Overview



## Warrick Power Plant

### Net Interchange

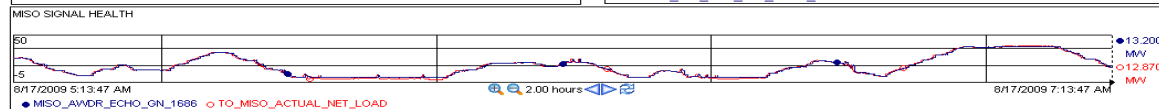
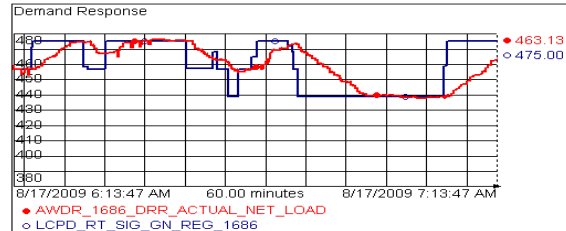
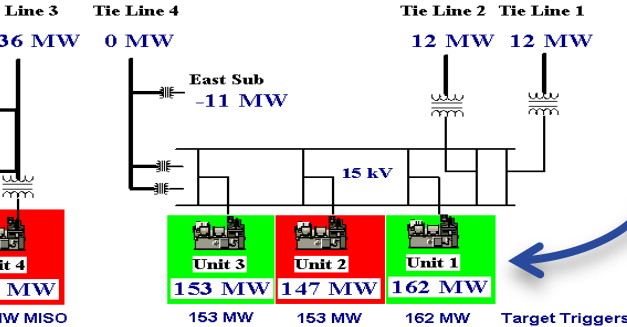
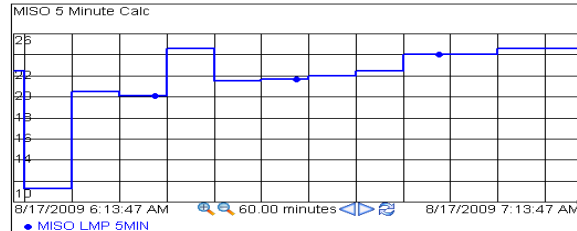
Total Tipline Flow	151 MW
Alcoa Load	520 MW
Total Net Gen	671 MW
Total Scrubber Load	29 MW
Total Net MVAR	59 MVAR

Real Energy	Regulation	Spin Reserve
Cleared 19	18	00
Deployed 19	-18	00

Last Hour LMP Price 20.77 dollars

Current Aver Price 21.04 dollars

8/17/2009 7:15:00 AM 25.17 5-MIN Forecast



Performance Indicators

Intra-net Accessible

Homepage

Demand Response

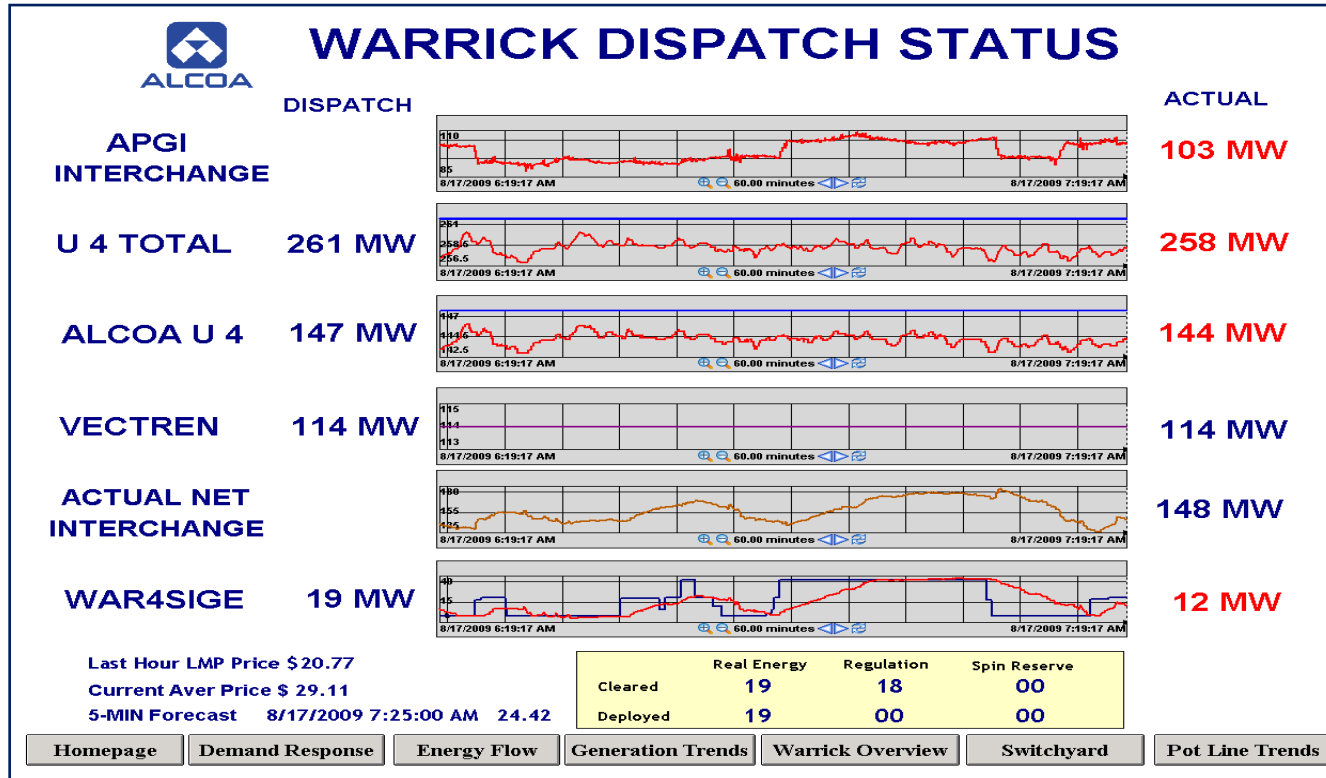
Energy Flow

Generation Trends

Warrick Overview

Pot Line Trends

# Power Plant Operating Tools



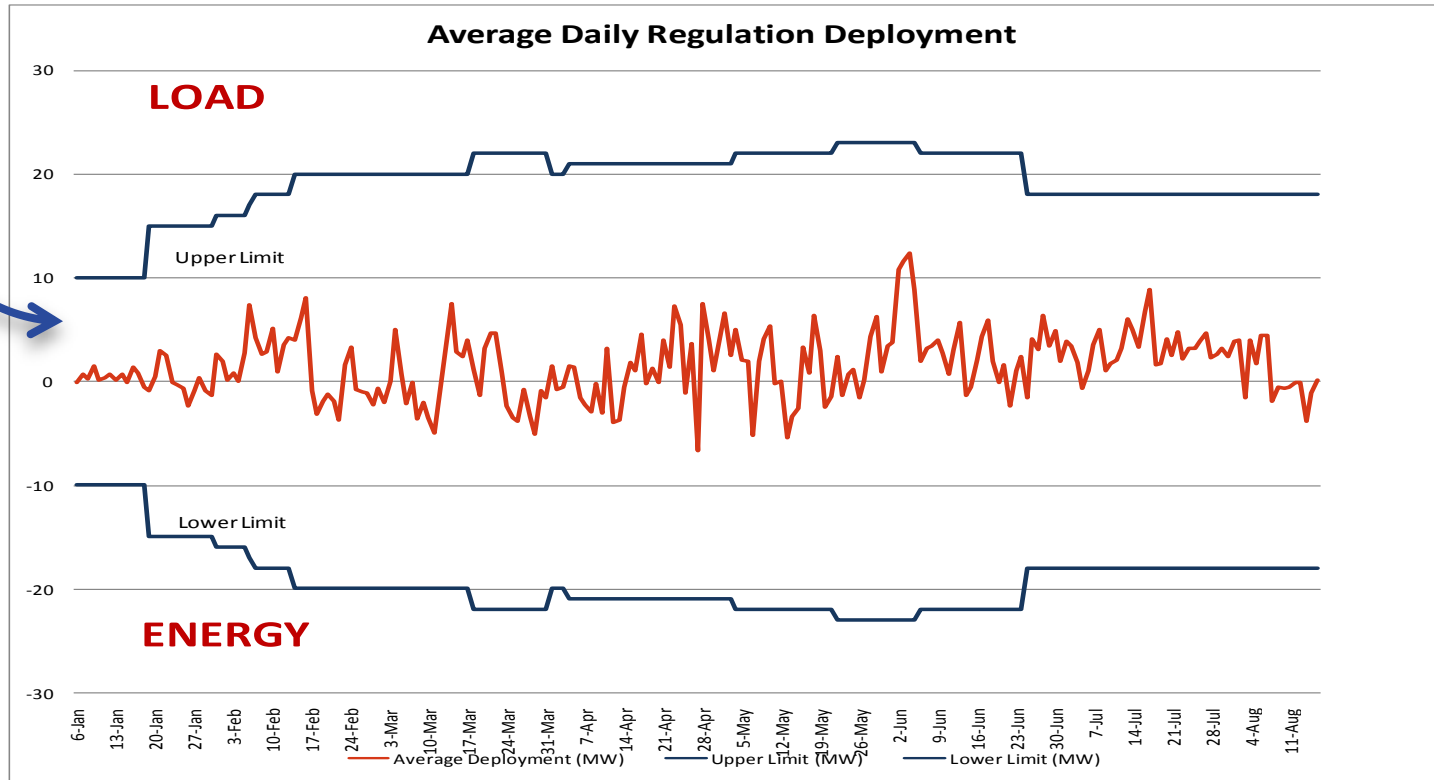
Functionality

Operator  
Buy-in

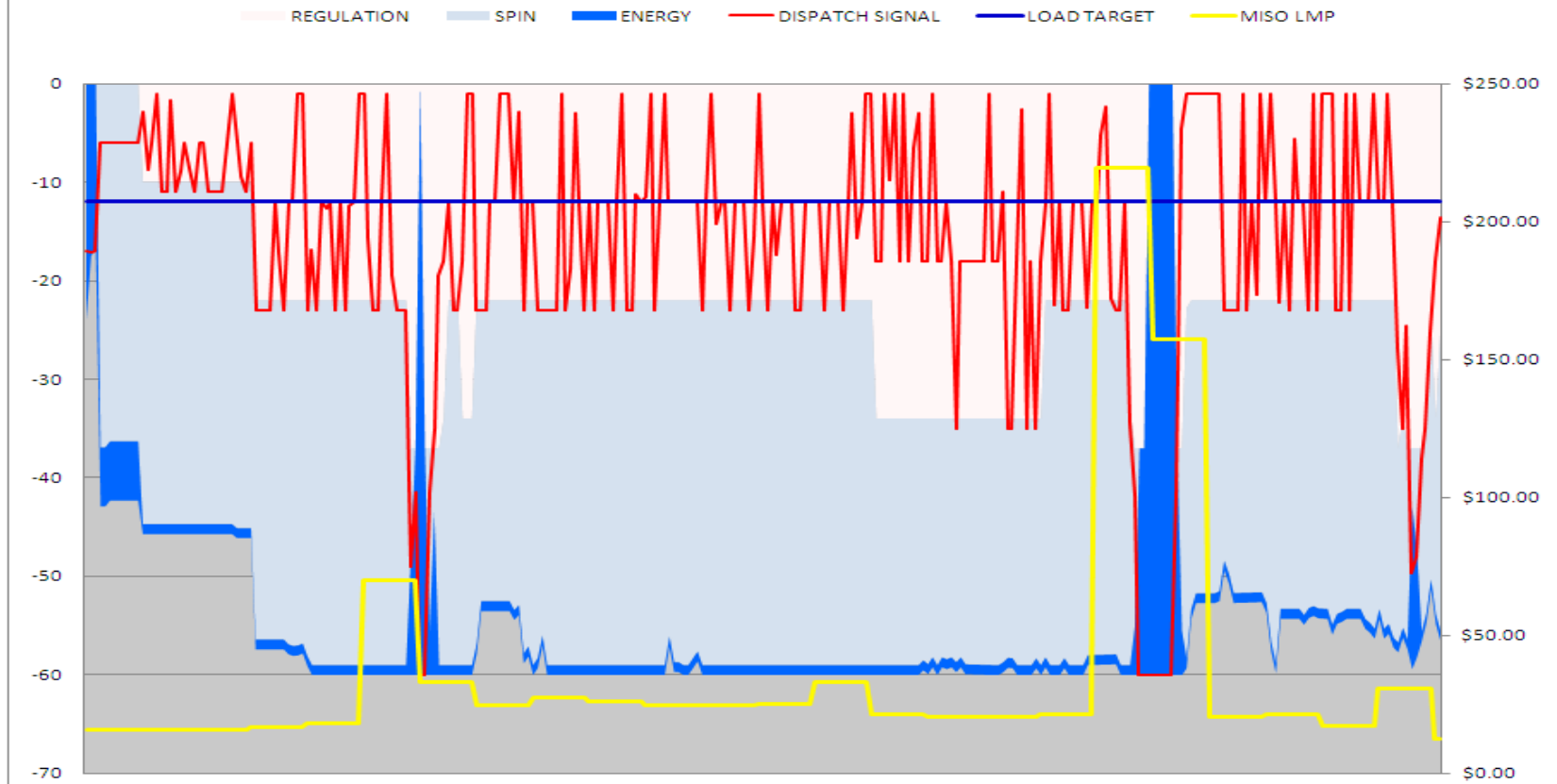
Ownership

# Daily Production Impact of Regulation

Data Analysis

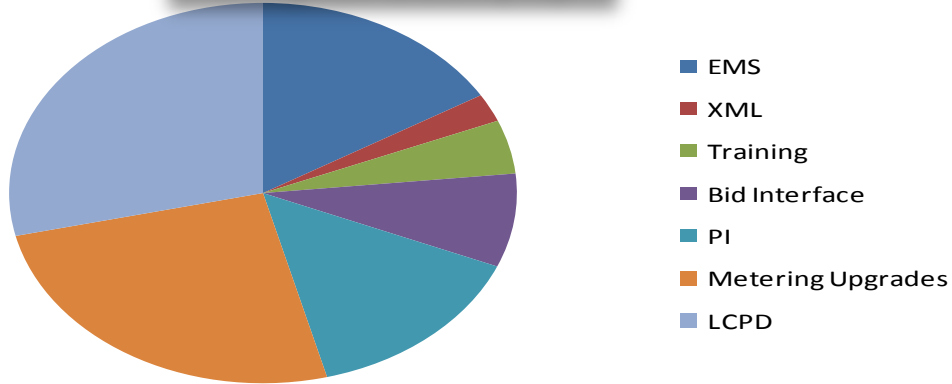


## Co-Optimized Dispatching for 24 Hrs



# Financial Benefits

Project Cost (%)



Project  
Payback?

4 Months

Total Project Cost = \$700,000

# MISO Interface Applications



- RoviSys selected as partner
- OSIsoft Partner
  - Consulting, SI and ISV
- MISO application scope
  - Submit energy bid and offer information
  - Monitor MISO for notifications
  - Submit forecasted load data from PI
  - Next – mobile application to schedule outages from cell phones

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# Thank you

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